Title: LOW LOSS TUNABLE FERRO-ELECTRIC
DEVICE AND METHOD OF CHARACTERIZATION

Inventor: TONCICH, STANLEY S.

Appl. No.: 10/750,304

Filing Date: 12/31/2003

Atty. Doc. No.: UD1 00001

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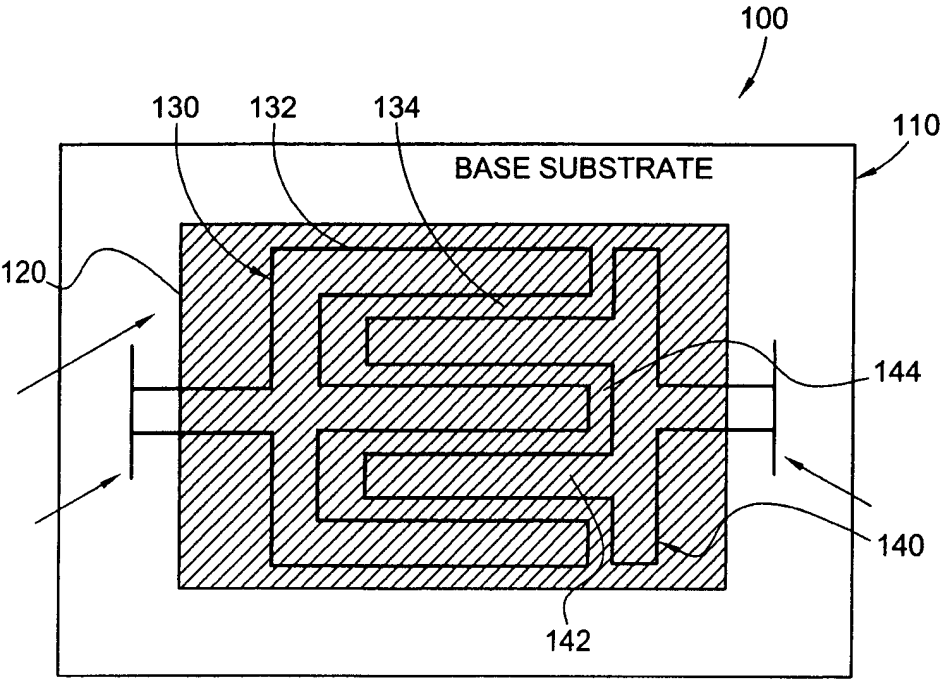
FIG. 1
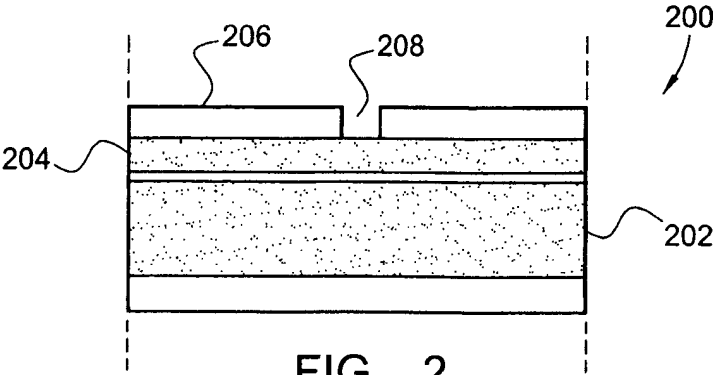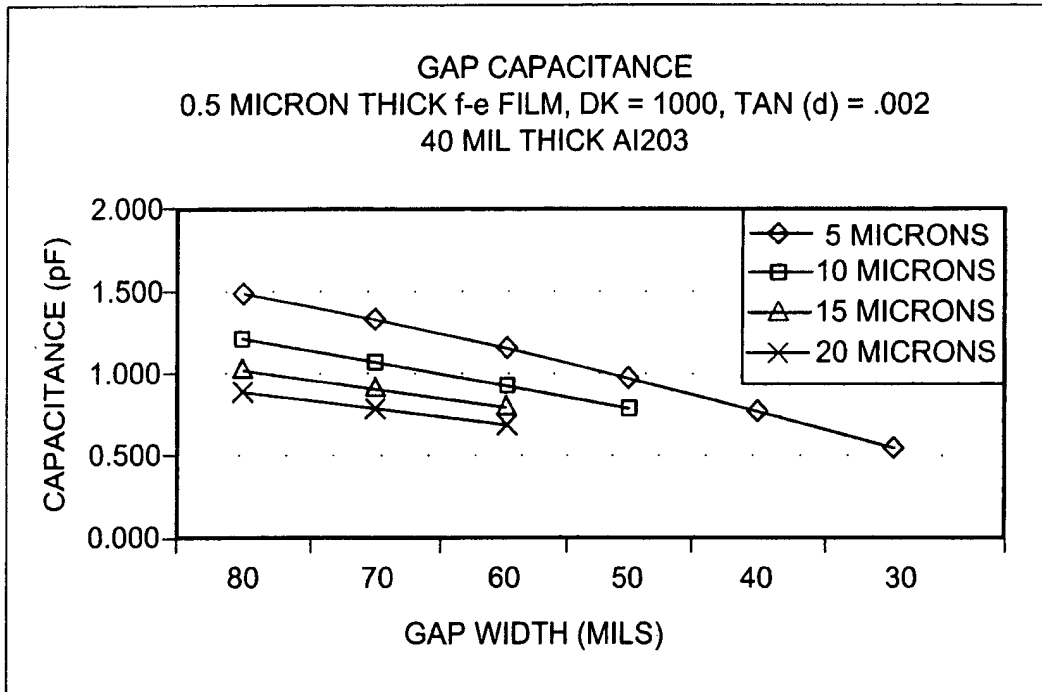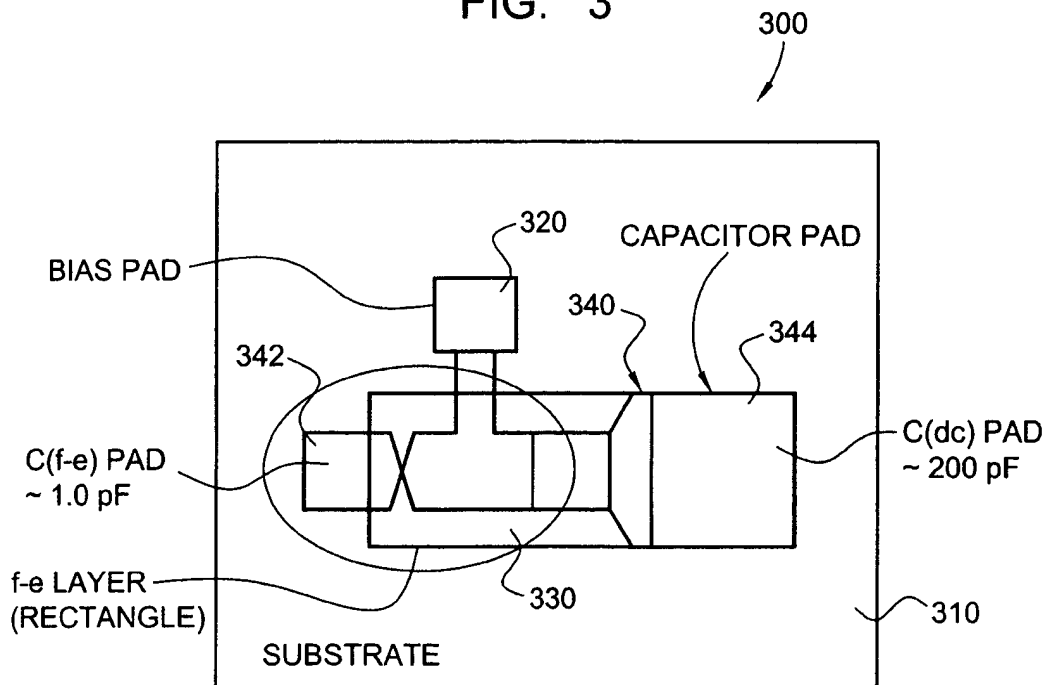

FIG. 2

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GAP CAPACITANCE
0.5 MICRON THICK f-e FILM, DK = 1000, TAN (d) = .002
40 MIL THICK AI203

FIG. 3

FIG. 4

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FIG. 5

FIG. 6

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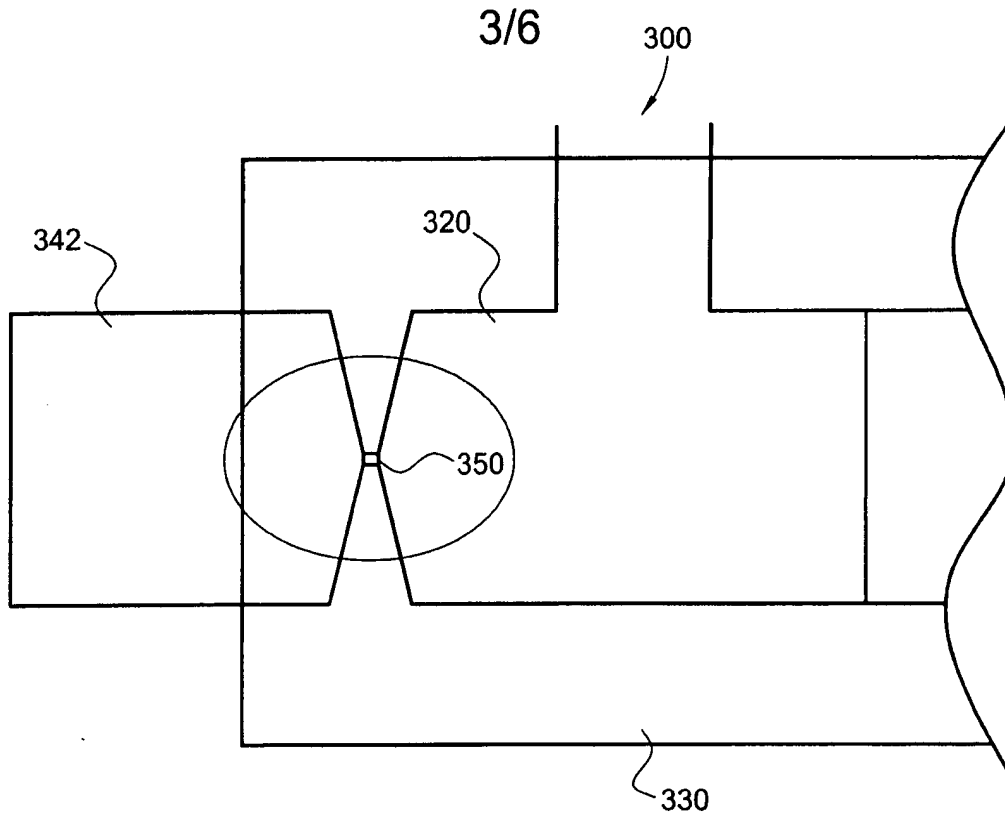| KWC	NRL	NRL CAPACITOR	NRL Q	KWC CAP	KWC Q	KWC Q	f_o	TUNING	COMMENTS
SAMPLE #	SAMPLE #	(pF)	(0 VDC)	(pF)	(0 VDC)	(40 VDC)	(MHz)	(MHz/V)	
01	NRL #1-A	1.012	10.1	0.99	190		1622	~1.0	
02	NRL #1-A	1.012	10.1	0.96	183		1605	~1.0	
01	NRL #3-A	1.004	10.1	0.90	101	123	1610	~1.0	
02	NRL #2-A	0.76	10.2	0.75	200		1900	~0.5	
06	NRL #2-A	0.76	10.2	0.72	205			~0.5	DAMAGED, HIGH V
05	NRL #2-A	0.76	10.2	0.71	196	200	1912	~0.5	

FIG. 7
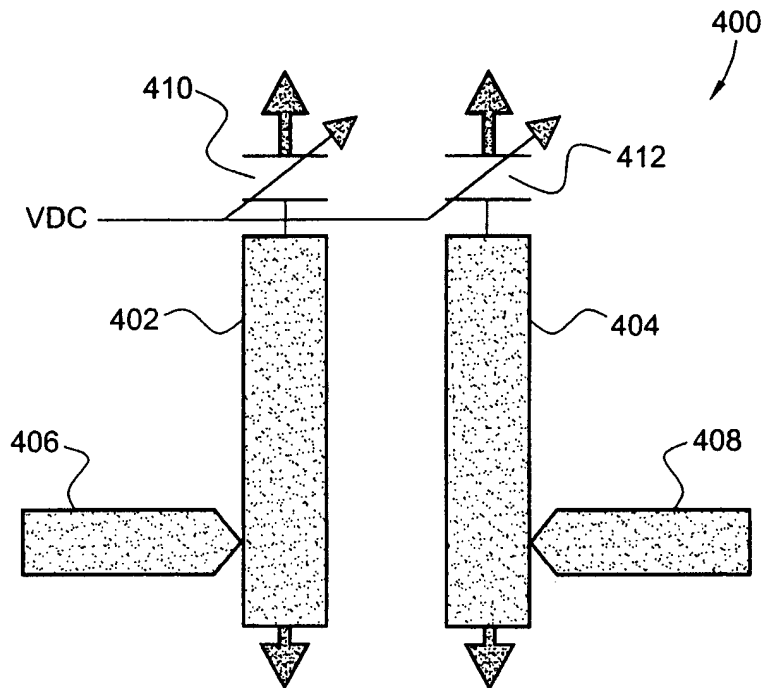

FIG. 8

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RESONATOR — 504

GAP — 508

INPUT LINE — 506

502

LOW LOSS SUBSTRATE

500

FIG. 9

VDC

610 — PRINTED f-e CAP C_{fe}

630 — C1   640 — C1

620 — $\lambda g/4$ RESONATOR
- MICROSTRIP
- COAX
- STRIPLINE
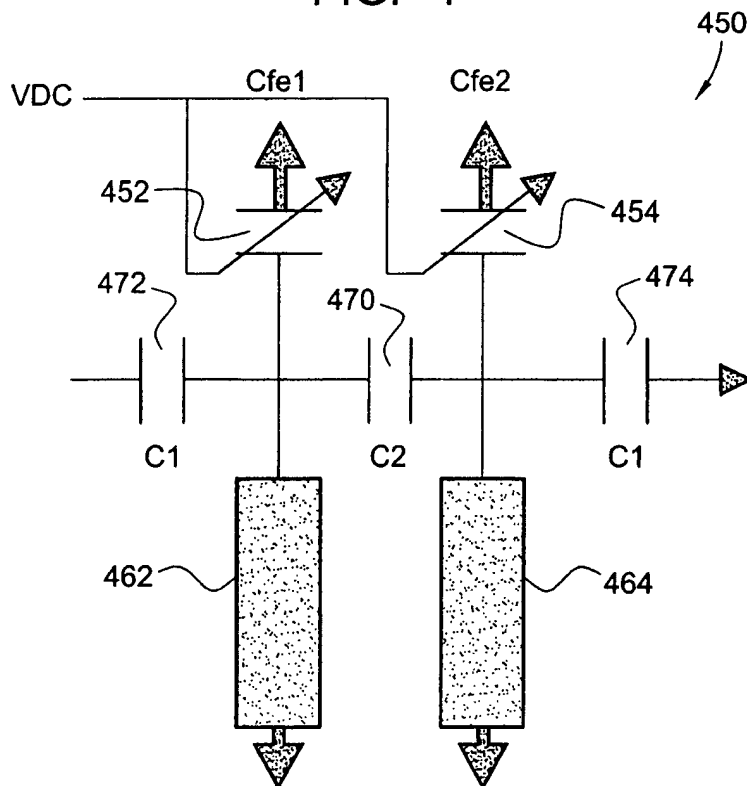
FIG. 10a

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REPLACEMENT SHEEET

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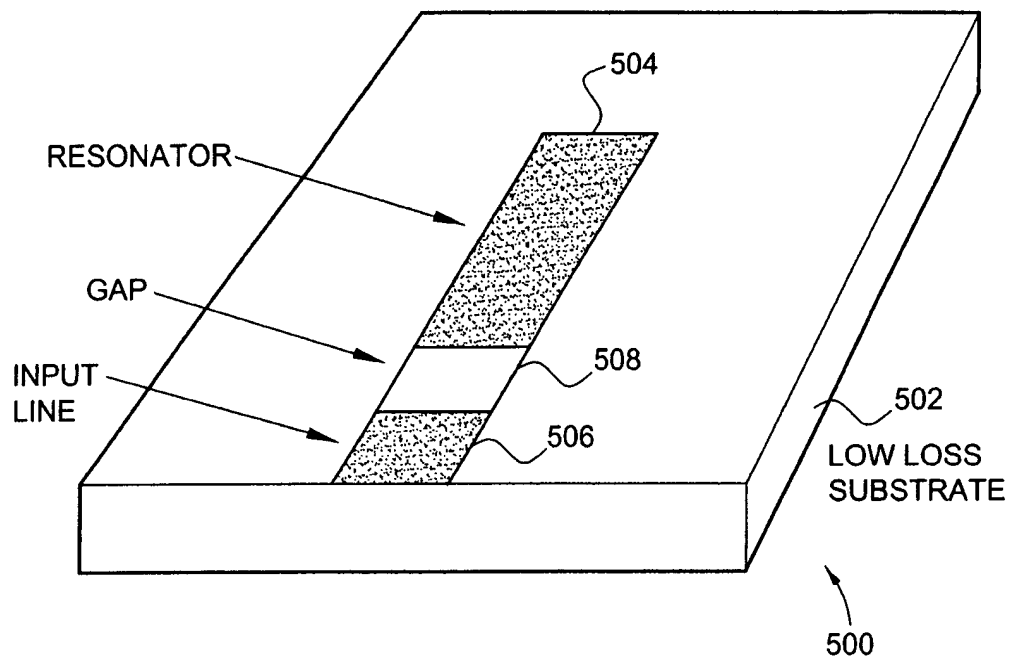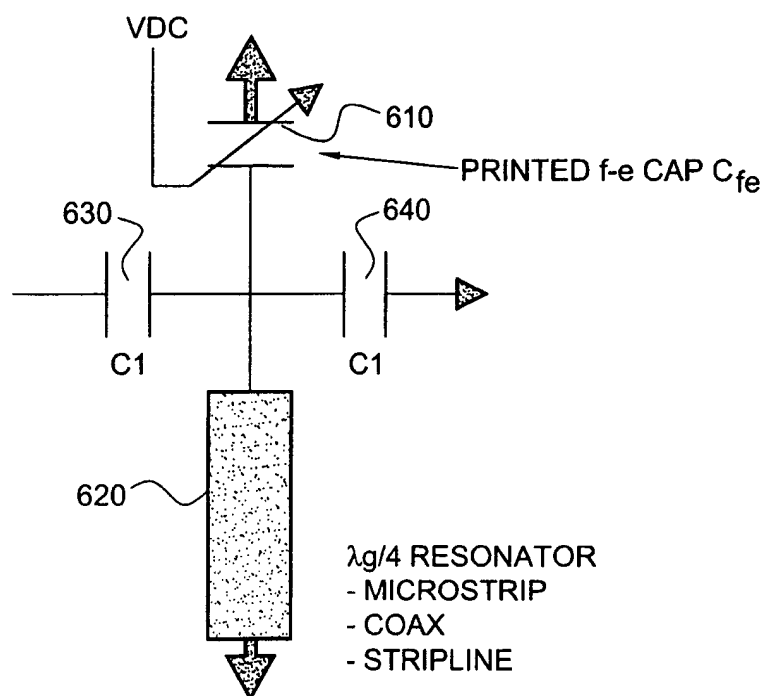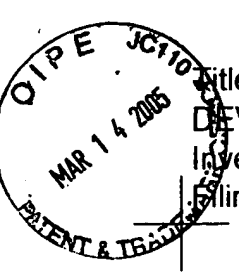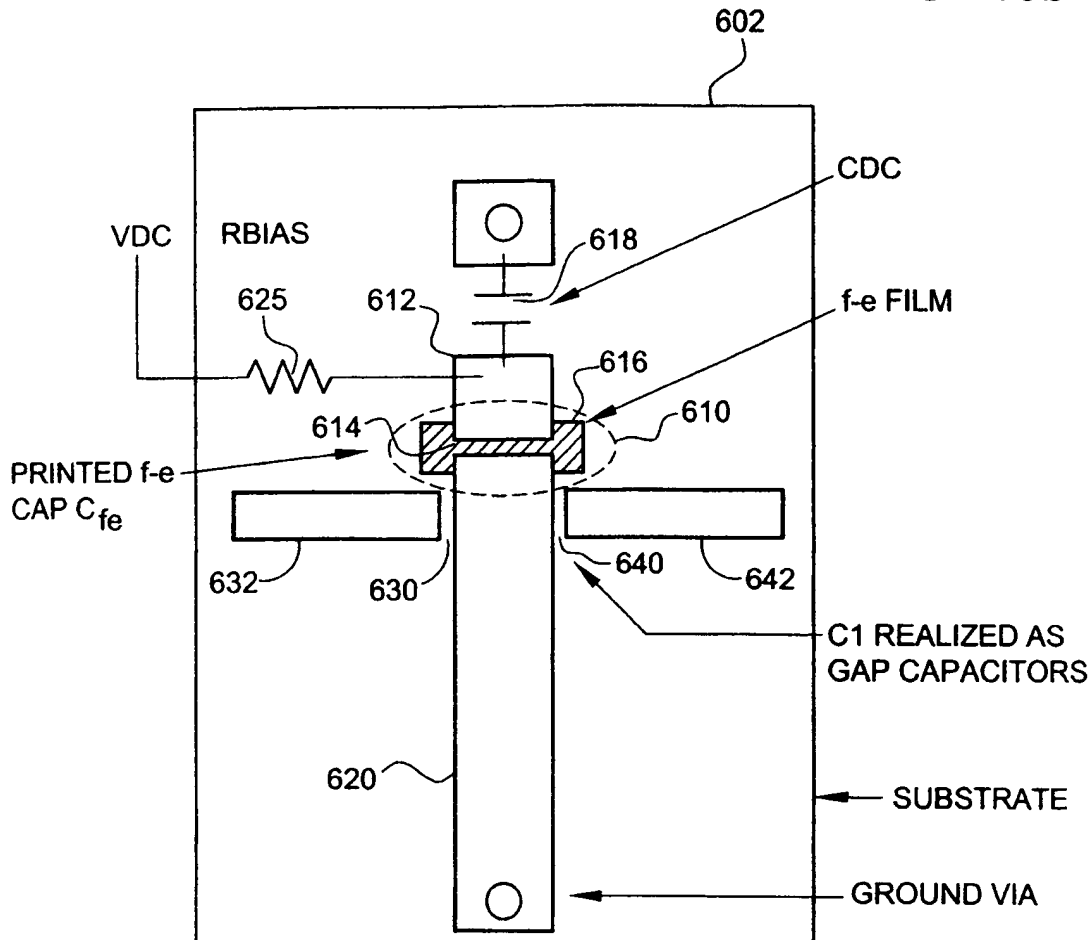
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FIG. 10b

PLANAR REALIZATION OF SINGLE RESONATOR BPF.
CAN BE REALIZED WITHOUT VIA'S USING GROUND PLANES
& A WILTRON TEST FIXTURE.

EXAMPLE OPERATING PARAMETERS

Temperature (degrees C)	Frequency (GHz)
Example 1: -50 to 100	Example 1: 0.25 to 7.0
Quality Factor (Q)	Example 2: 0.8 to 7.0
Example 1: > 80	Example 3: 0.25 to 2.5
Example 2: > 180	Example 4: 0.8 to 2.5
Capacitance (pF)	
Example 1: 0.3 to 3.0	
Example 2: 0.5 to 1.0	
Example 3: 0.8 to 1.5	